

FLIGHT SUMMARY REPORT

Flight Number: 97-009-02
Calendar/Julian Date: 14 September 1997 • 257
Sensor Package: Thermal Infrared Multispectral Scanner (TIMS)
DoE Multispectral Scanner (MSS)
Area(s) Covered: Death Valley, Site 731
Mount Humphries, Site 750

Investigator(s): Gillespie, University of Washington
Hook, JPL

Aircraft #: 799
Department of Energy
Cessna Citation

SENSOR DATA

Accession #:	----	----
Sensor ID #:	086	1268
Sensor Type:	TIMS	MSS
Focal Length:	----	----
Film Type:	----	----
Filtration:	----	----
Spectral Band:	----	----
f Stop:	----	----
Shutter Speed:	----	----
# of Frames:	----	----
% Overlap:	----	----
Quality:	Good	Good
Remarks:		

Airborne Science and Applications Program

The Airborne Science Branch at NASA's Dryden Flight Research Center, Edwards, California, operates two ER-2 high altitude aircraft in support of NASA earth science research. The ER-2s are used as readily deployable high altitude sensor platforms to collect remote sensing and in situ data on earth resources, celestial phenomena, atmospheric dynamics, and oceanic processes. Additionally, these aircraft are used for electronic sensor research and development and satellite investigative support.

The ER-2s are flown from various deployment sites in support of scientific research sponsored by NASA and other federal, state, university, and industry investigators. Data are collected from deployment sites in Kansas, Texas, Virginia, Florida, and Alaska. Cooperative international scientific projects have deployed the aircraft to sites in Great Britain, Australia, Chile, and Norway.

Photographic and digital imaging sensors are flown aboard the ER-2s in support of research objectives defined by the sponsoring investigators. High resolution mapping cameras and digital multispectral imaging sensors are utilized in a variety of configurations in the ER-2s' four pressurized experiment compartments. The following provides a description of the digital multispectral sensor(s) and camera(s) used for data collection during this flight.

Department of Energy Remote Sensing Laboratory

The NASA Airborne Science and Applications Program at Ames Research Center contracted with the Department of Energy Remote Sensing Laboratory (RSL) in Las Vegas, Nevada to fly the RSL Multispectral Scanner (MSS) and the NASA Thermal Infrared Multispectral Scanner (TIMS) over the desert southwest. The scanners were flown on the DOE Cessna Citation.

The Cessna Citation is a low and medium altitude, moderate speed aircraft. It can operate from 4,000 to 35,000 feet above sea level at speeds between 135 and 225 knots. There are two instrument ports in the aircraft. The RSL 1268 Multispectral Scanner was mounted over the aft port and the NASA Thermal Infrared Multispectral Scanner was mounted over the forward port.

RSL Daedalus 1268 MSS

The DOE Multispectral Scanner simulates the spectral characteristics the Thematic Mapper (TM) multispectral scanners orbiting on Landsat 4 and Landsat 5. The seven TM bands are replicated with the MSS and four additional bands of discrete wavelengths are acquired. THE MSS acquires TM band six (thermal data) as two bands in low and high gain settings. The scanner is configured as follows:

<u>Daedalus Channel</u>	<u>TM Band</u>	<u>Wavelength, mm</u>
1	A	0.42 - 0.45
2	1	0.45 - 0.52
3	2	0.52 - 0.60
4	B	0.60 - 0.62
5	3	0.63 - 0.69
6	C	0.69 - 0.75
7	4	0.75 - 0.90

8	D	0.91 - 1.05
9	5	1.55 - 1.75
10	7	2.08 - 2.35
11	6	8.5 - 12.5 low gain
12	6	8.5 - 12.5 high gain

Sensor/aircraft parameters are as follows:

IFOV:	2.5 mrad
Total Scan Angle:	86°
Pixels/Scan Line:	716
Scan Rate:	12.5/25/50/100 scans/second

Thermal Infrared Multispectral Scanner

The Thermal Infrared Multispectral Scanner (TIMS) is a multispectral scanning system using a dispersive grating and a six element mercury cadmium telluride detector array to produce six discrete channels in the 8.2 *mm* to 12.2 *mm* region.

<u>Channel</u>	<u>Wavelength, <i>mm</i></u>	<u>NET</u>
1	8.2 - 8.6	< 0.3° C
2	8.6 - 9.0	< 0.3° C
3	9.0 - 9.4	< 0.3° C
4	9.4 - 10.2	< 0.3° C
5	10.2 - 11.2	< 0.3° C
6	11.2 - 12.2	< 0.3° C

Sensor/aircraft parameters are as follows:

IFOV:	2.5 mrad
Ground Resolution:	163 feet (50 meters) at 65,000 feet
Total Scan Angle:	76.56°
Swath Width:	16.9 nmi (31.3 km) at 65,000 feet
Pixels/Scan Line:	638
Scan Rate:	7.3 (scans/second)
Ground Speed:	400 kts. (206 m/second)

Information on data tape format, logical record format, and scanner calibration data may be obtained from the Aircraft Data Facility, NASA-Ames Research Center, Mail Stop 240-6, Moffett Field, California 94035-1000 (Telephone: 650-604-6252).

TIMS FLIGHT DATA
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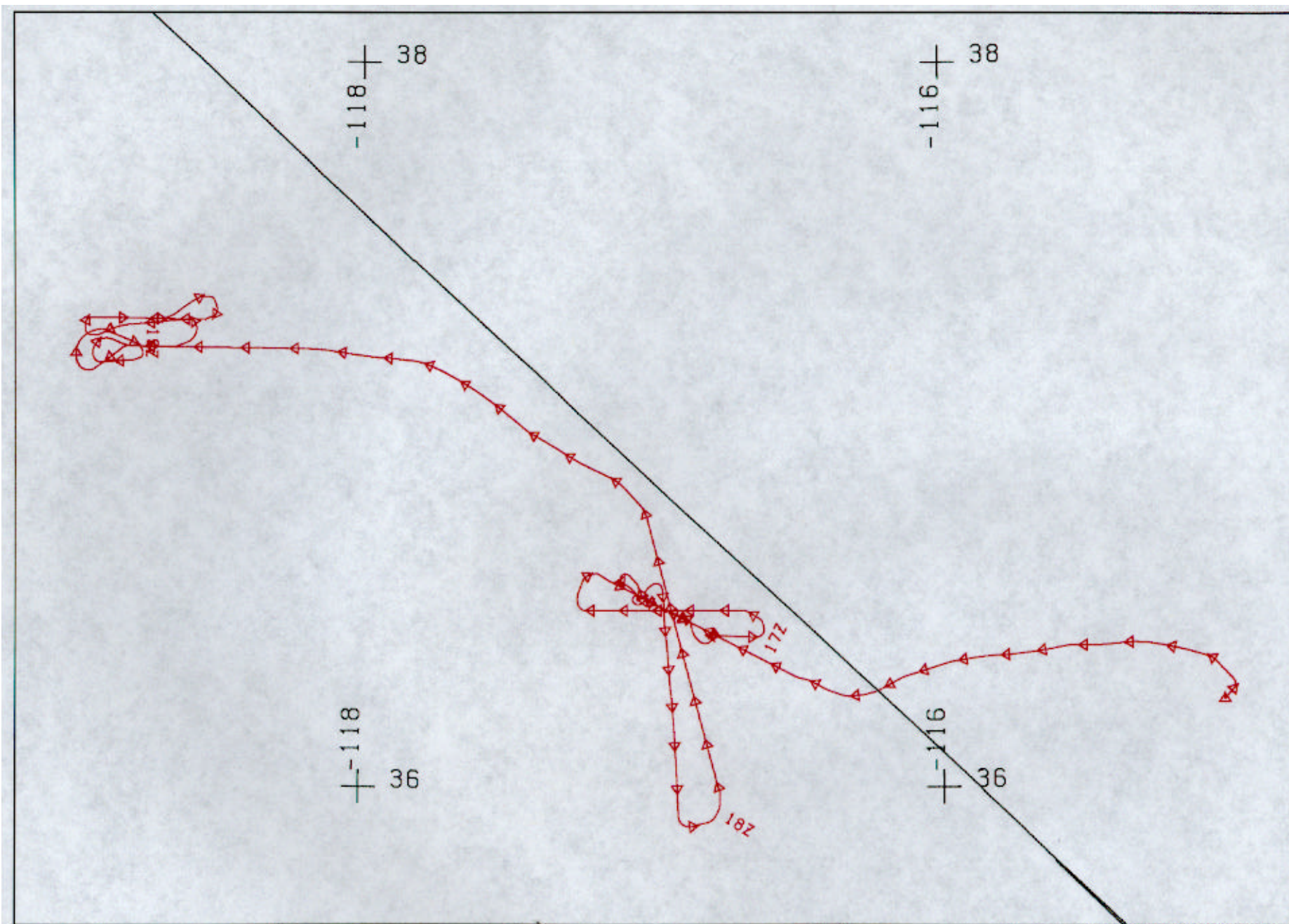
Site	Line	Run	A c t u a l t i m e (GMT) b e g i n e n d	A c t u a l s c a n l i n e b e g i n e n d	Altitude feet/meter	Scan Speed (rps)	total G o o d s c a n l i n e s	total I n t e r p o l a t e d s c a n l i n e s	total R e p e a t e d s c a n l i n e s
1.	731	1	1	17:03:38.0 17:07:10.0	29094 34355	6000/ 1829 25.00	5262	0	0
2.	731	1	2	17:10:48.0 17:14:51.0	39782 45841	6000/ 1829 25.00	6060	0	0
3.	731	3	1	17:22:35.0 17:29:38.0	52409 62934	12000/ 3658 25.00	10526	0	0
4.	731	2	1	17:34:34.0 17:38:42.0	70302 76457	12000/ 3658 25.00	6156	0	0
5.	731	4	1	18:02:19.0 18:12:20.0	94647 109597	25000/ 7620 25.00	14951	0	0
6.	750	2	1	18:36:21.0 18:37:39.0	145271 147214	25000/ 7620 25.00	1944	0	0
7.	750	2	2	18:42:14.0 18:42:43.0	154060 154768	25000/ 7620 25.00	709	0	0
8.	750	2	2	18:48:07.0 18:49:04.0	162824 164239	25000/ 7620 25.00	1416	0	0
9.	750	1	1	18:58:39.0 19:00:41.0	178564 181580	6500/ 1981 25.00	3017	0	0
10.	750	1	2	19:08:07.0 19:10:00.0	192692 195487	6500/ 1981 25.00	2796	0	0

Note: Site 731 Death Valley
Site 750 Mt Humphries

DoE DAEDALUS TMS FLIGHT DATA
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Site	Line	Run	A c t u a l t i m e (GMT) b e g i n e n d		A c t u a l scanline begin e n d		Altitude feet/meter	Scan Speed (rps)	total G o o d scanlines	total Interpolated scanlines	total Repeated scanlines	
1.	731	1	1	17:03:38.6	17:07:10.1	102347	107633	6000/ 1829	25.00	5287	0	0
2.	731	1	2	17:10:47.4	17:14:50.6	113065	119147	6000/ 1829	25.00	6083	0	0
3.	731	3	1	17:22:35.6	17:29:39.2	126787	132083	12000/ 3658	12.50	5297	0	0
4.	731	2	1	17:34:34.0	17:38:42.5	135768	138874	12000/ 3658	12.50	3107	0	0
5.	731	4	1	18:02:06.6	18:12:19.3	156425	164084	25000/ 7620	12.50	7660	0	0
6.	750	2	1	18:36:19.6	18:37:38.1	182088	183069	25000/ 7620	12.50	982	0	0
7.	750	2	2	18:42:13.1	18:42:42.1	186506	186869	25000/ 7620	12.50	364	0	0
8.	750	2	3	18:48:05.1	18:49:02.8	190906	191628	25000/ 7620	12.50	723	0	0
9.	750	1	1	18:58:39.9	19:00:44.3	205541	208650	6500/ 1981	25.00	3110	0	0
10.	750	1	2	19:08:06.7	19:09:59.0	219710	222518	6500/ 1981	25.00	2809	0	0

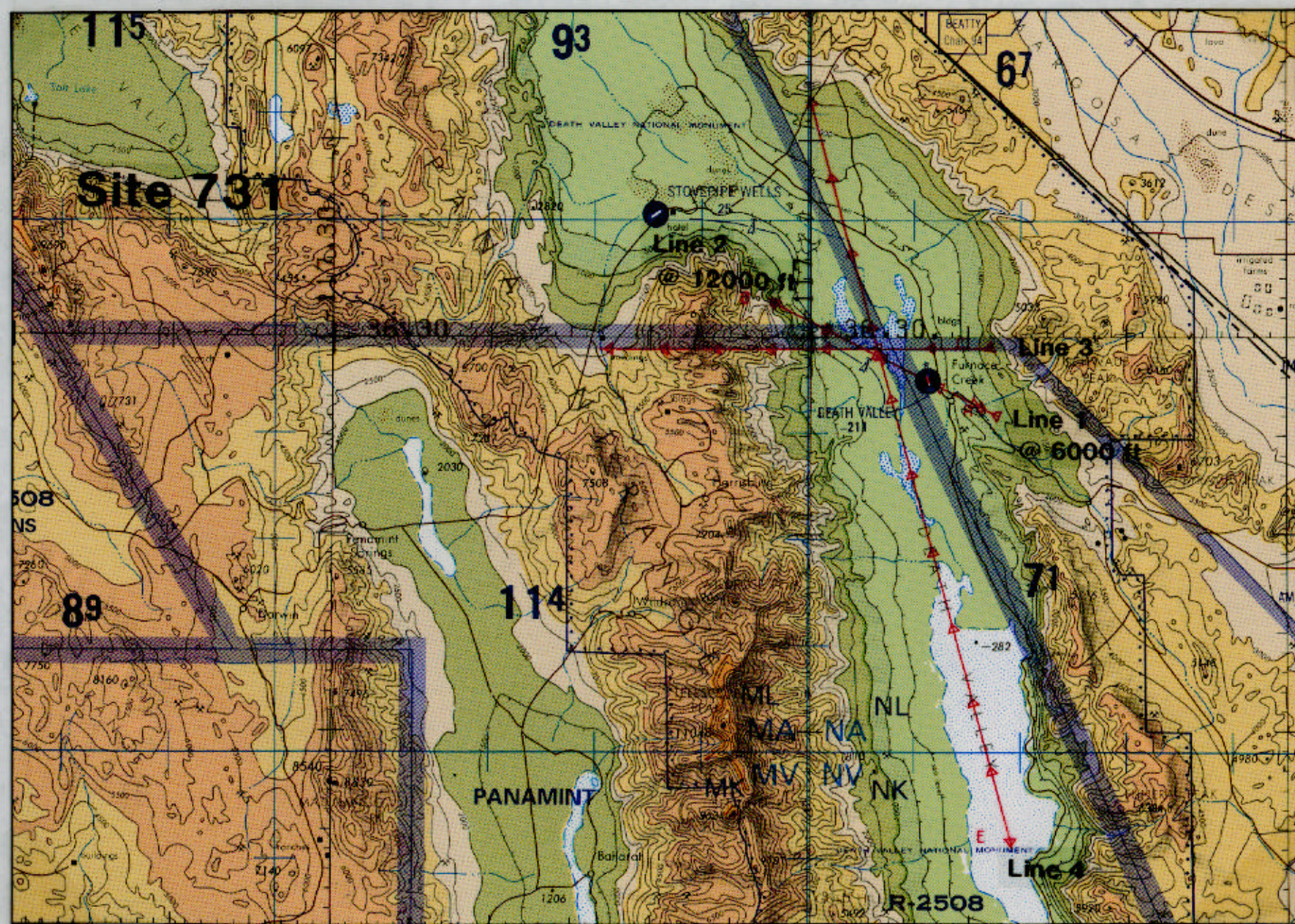
Note: Site 731 Death Valley
Site 750 Mt Humphries



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TPC G-18B

